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Uniform Issue Procedures

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UNIFORM ISSUE PROCEDURES

A graduate project submitted to Dakota State University in partial fulfillment of the requirements for the degree of

Master of Science

in

Information Systems

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By
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PROJECT APPROVAL FORM

We certify that we have read this project and that, in our opinion, it is satisfactory in scope and quality as a project for the degree of Master of Science in Information Systems.

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Master's Project Title: Uniform Issue Procedures

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Committee member: Chris Olson Date: Nov 16, 2012

DECLARATION

I hereby certify that this project constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

I declare that the project describes original work that has not previously been presented for the award of any other degree of any institution.

Signed,

_____

Dennis Duggan

ABSTRACT

Within an environment of constrained budgets and technology advancements the Department of Defense has established Information Service objectives that include standardization, interoperability and cost savings. Service branches manage the distribution of uniforms for their respective services. The replacement of damaged and lost uniform articles is managed by the service branch. The services do not cooperatively manage or track the issue of uniforms and are left with annually increasing expenditures for replacing lost or damaged uniform articles.

The research conducted was in consideration of the design, planning and documentation of a secure, standardized and scalable web enabled inventory system that could track the issuing and receipt of military uniforms across the services. The DoD is a complicated, vast group of agencies with a multitude of policies and regulations. Agencies within DoD share interrelationships and agreements with resulting dependencies. Research time was needed to review policies and regulations so that the system could be interoperable and compliant with federal law and agency regulations.

Research began with the review of relevant DoD policies and regulations and continued with determining the right toolset to build a system with standardization, security, stability and scalability in mind. Emphasis was placed on industry relevant technologies. ASP.net was chosen along with SQL SERVER 2008 offered with the Visual Web Developer kit. Considerable research time was dedicated to the Uniform Modeling Language for system documentation. During design phase time was dedicated to web page design approach but a more significant amount of time was committed to researching the use of and skill development in ASP.net and SQL SERVER 2008 due to lack of experience with these tools. Many websites were referenced along with several texts to gain knowledge and experience with the software.

The methodology applied for ISSUE did not follow a typical or traditional SDLC approach. A decision was made that the ISSUE system would be a web based inventory system including a GUI with a backend database for transactions as well as a database for file storage with Visual Web Developer as the tool of choice.

The traditional SDLC was not the approach undertaken for this project. Instead of entering the system design phase, implementation and coding began before any design considerations. Software development resulted in a web enabled inventory system with authentication and transactions with the backend database, file storage for documentation as well as relevant links to governing regulations and other useful links. The resulting system documentation included UML system diagramming, tables with technical data and system design considerations as well as text documentation.

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CHAPTER 1

INTRODUCTION

Background of the Problem

ISSUE is the Issuing Standardized System for Uniform and Equipment. Issue is a pilot program with an objective of standardizing and enforcing accountability of uniform issuance and uniform allowances. Due to projected constrained defense budgets the Department of Defense has been forced to integrate systems and reduce costs. The system will document and account for service member's uniforms and equipment at basic training and provide updates on allowances for uniforms. The services do not currently have an enterprise automated system in place which documents the service member's initial uniform issue. DoD has spent millions on replacement of lost, damaged or stolen articles of uniforms and equipment. DoD has no global system in place to recoup funds or maintain accountability of issued uniforms.

ISSUE is a repository for signed documents verifying receipt of the uniform or associated equipment issued to the service member. By documenting the issuing of uniforms and associated equipment service members will bear responsibility for the maintenance and accountability of the uniforms and associated equipment that are issued during basic training and thereafter. The SM (service member) will read and sign for their initial issue. If materials have to be replaced later on due to fault of the SM they will have the costs of the uniform or equipment subtracted from their pay with a statement of charges. Also, to assure that service members are receiving the proper issue, the system will track what is issued. The system aims to remove duplication and end outdated procedures while standardizing the issuing process across the services. Issue will save DoD money and develop service members who are more accountable for their gear while standardizing the way we do business.

Statement of the problem

During basic training service members are provided their initial uniform issue. A CIIP or clothing initial issue point is where members receive their uniforms. A CIIP is owned and

inventoried by the Defense Logistics Agency. Each service branch has the responsibility for managing operations at each CIIP including the issue, oversight and policy of issuing uniforms within their own service. There is no current DoD wide centralized system that tracks the issue of service member's uniforms and annual allowances for uniforms (United States Army, n.d.).

Each of the services has their own procedures and policies for the issuing and inventory management of the service member's uniforms. Army Regulation 700-84 states: A copy of DA Form 3078 is retained with the soldier's unit file until all initial issues have been completed and the soldier reaches his/her initial permanent duty station. DA form 3078 is a personal clothing request. The soldier's unit file is a folder of paper documents and forms. Forms such as the DA 3078 may be digitized but are also filed as a hard copy as per regulation (Department of the Army, 2004).

The services lack a standardized system that tracks and inventories forms such as the DA 3078 for documenting uniform transactions. Documents and receipts for uniforms that are issued are not stored in an automated central repository. DoD is left with annual losses in the millions because there is no centralized intake and inventory system to reflect the uniforms that are issued to service members.

Objectives of the project

The purpose of the ISSUE system is to standardize the tracking and receipt of all uniform transactions across the services. Objectives include building a secure, standardized and scalable web based inventory system for easy to use updating and querying of service member uniform transactions and documents. The system will concur with many policy objectives DoD has established, including standardization, cost savings, and interoperability.

Standardization. By having one system that all services rely on for easy updating and tracking of service member uniforms the services will continue to move toward standardized enterprise combat support automated solutions.

Cost savings. By standardizing the way uniform transactions are documented and tracked DoD will enhance cost savings through

- service members shared responsibility for their personal gear
- maintaining proper accountability with a document trail

- relieving manual/duplicate procedures of hard files and standardizing the process across the services
- lower the administrative/logistical footprint

Interoperability. To improve how services interact and integrate automation. Issue will continue the process of having services work together and benefit from shard knowledge through progressive movement toward a Joint Enterprise.

Issue pilot. The Issue pilot is a developmental architecture for the anticipated outcome of a global system. The pilot program deliverables include a Graphical User Interface and backend databases for document storage and customer transaction data. The Defense Information Systems Agency (DISA) has begun migration of key systems to the Cloud. The Issue front-end tool and back-end databases will be hosted in a virtualized data center.

CHAPTER 2

LITERATURE REVIEW

Each branch of service issues the service member a full set of uniforms soon after their arrival at basic training. The service member also receives scheduled uniform allowances throughout their careers to maintain and upgrade their uniforms. Departmental regulations cite accountability procedures for issued clothing and personnel allowances.

A personnel file follows the service member from basic training through job related training and throughout their career. The personnel file is composed of paper (hard copy) documents that are also stored in digital format and are accessible to the service member and authorized personnel. The file follows the SM throughout their career. Upon separation or retirement the file is turned into a centralized Human resources department. Service members are encouraged to keep copies.

The respective services use Departmental forms to document the issuance of uniforms. A hard copy of the form is stored in the SM's personnel file. The Army uses DA form 3078. Army Regulation 700-84 Chapter 5-1 states the following:

> DA Form 3078 will be the only document used to obtain personal clothing items for Active Army enlisted soldiers and USAR enlisted soldiers. This form is available through normal publication supply channels and is on the Web atwww.apd.army.mil/. ARNG requestors supported by the CCDF will use the electronic or printed forms prescribed in the Central Clothing Distribution (CCD) User Handbook.
>
> A. DA Form 3078 is an auditable document. The form is subject to formal and informal auditing and is a receipt for the enlisted soldier. It is also a supporting document for the unit and FAO. (citation needed)

This same regulation AR 700-84 also cites in Chapter 4-3 annual uniform allowances that the service member is authorized:

> a. Monetary allowances. In all areas where the CMA system is in effect, personal clothing initially provided at Government expense will be maintained up to the

prescribed allowances by enlisted soldiers at their own expense. A monetary allowance for the cost of replacement and purchase of new items will be paid to enlisted soldiers annually on the anniversary month the soldier entered the service. This allowance will be paid along with and in addition to regular pay. Clothing replacement allowance (CRA) also may be used to buy additional quantities of personal clothing items (Department of the Army, 2004)

CHAPTER 3

SYSTEM DESIGN

Business Requirements Document

The proposed system design is based on initial security, performance, and availability requirements identified in the document as well as business process requirements represented with UML diagramming that address the problem statement and objectives discussed in the introduction.

The business process requirements are represented by UML diagrams including a Business process flow Use case diagram with corresponding use cases. The high level view documented in the following Business process flow diagram shows the actors relationship to the system and the basic functions of the system. The corresponding use cases that follow provide insight into these functions, the relationships between them and the behavior of the actors that enable the business flow.

A User interface activity diagram provides increased scope to the activities and dependencies of Use Case 2 by providing a snapshot, diagramming Use case 2, Add Transactions.

Initial business requirements for security, performance and availability are specificly listed. They are based on feedback from users and engineers and have provided a basis to determine the needed network, backup/recovery and storage capacity system requirements that are also listed. The system engineering staff have established these "hard" requirements based on the provided business requirements while giving consideration to DoD Agency policies, regulations as well as industry standards. Federal law mandates compliance with Section 508 (Roberts, 1999).

Business Process Flow / Overview

The proposed Business flow Use Case diagram includes 2 actors and 3 use cases. Actor DLA clerk creates an account in the Issue.mdf database for the service member during

basic training. Actor Supply clerk then has access to the system to add and then view a transaction from the Issue.mdf database that corresponds to the account created by the DLA clerk. Transactions for the service member are added by the supply clerk throughout the career of the service member.

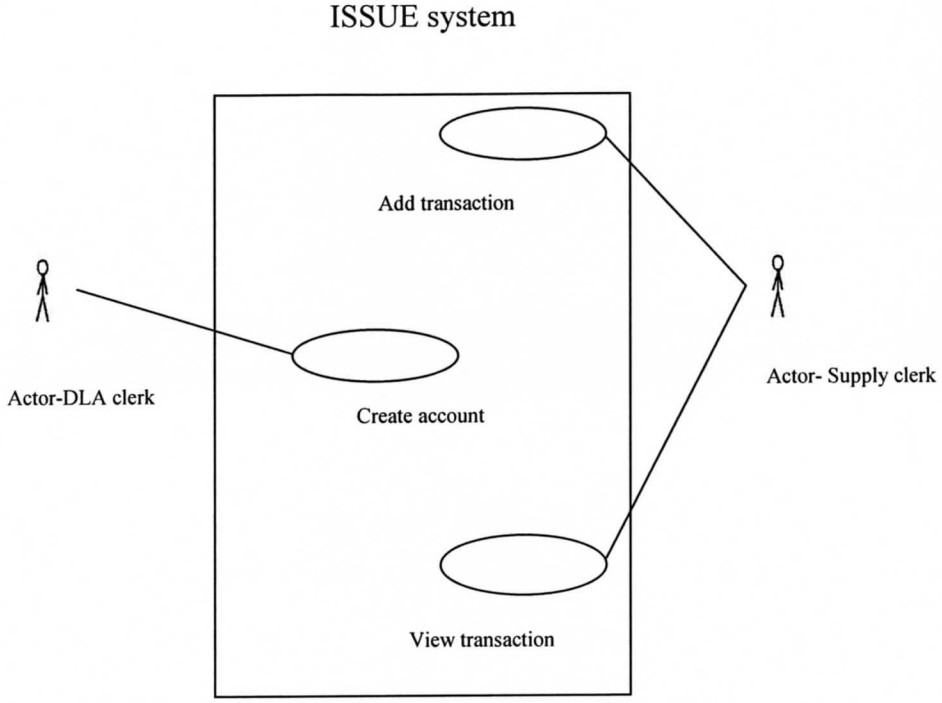


Figure 1. Business flow use case diagram

The following use cases correspond to the Business flow use case diagram. The use cases extrapolate the flow of the business and dependencies among themselves.

Use case 1. Create Account represents an account created by a Defense Logistics Agency clerk for a new service member during basic training. The account is created and added to the Issue.mdf database by a DLA clerk at a uniform processing facility or CIIP during basic training.

Table 1. Use Case 1. Create Account characteristic information

Characteristic	**Information**
Brief Description	An account is created for a new client
Primary Actor	DLA clerk
Stakeholders	System administrators Authorized users
Trigger	DLA clerk enters the client's data into the Create account fields and presses submit
Preconditions	All fields on the Create account page must be filled in and meet validation rules
Guarantees	*Success End Condition* New account is created *Failed End Condition* DLA clerk is unable to create an account
Main Success Scenario	1. DLA clerk logs into the website and navigates to the Create account page 2. Clerk adheres to validation rules, fills in all the required fields and presses submit 3. New account is created in the database

Use case 2. Add Transaction documents a supply clerk or DLA clerk adding a transaction to the Issue.mdf database. A transaction is added for the account created in use case 1, Create Account. These transactions are an initial issue at basic training for the service member by the DLA clerk or a single item transaction from a Supply clerk when a lost, stolen or damaged uniform article is issued to the service member anytime following basic training. The clerk fills in required fields in the system and adds a document such as a DA 5965 to a file storage database which is a repository for transaction receipts. (Freeman, Mabbutt, & MacDonald, 2010)

Table 2. Use Case 2. Add Transaction characteristic information

Characteristic	**Information**
Brief Description	Transaction is added to client account
Primary Actor	Supply clerk
Stakeholders	System administrators Authorized users Client
Trigger	Supply clerk enters transaction data into Add Transaction fields and presses submit
Preconditions	All fields on the Add Transaction page must be filled in and meet validation rules
Guarantees	*Success End Condition* A client transaction is added to the database *Failed End Condition* Supply clerk is unable to add transaction
Main Success Scenario	1. Supply clerk logs into the website and navigates to the Add Transaction page 2. Clerk adheres to validation rules, fills in all the required fields and presses submit 3. New client transaction is created in the database

Use case 3. View Transaction allows a supply clerk to view all transactions added in use case 2, Add Transaction that are related to the service member and stored in the Issue.mdf database. The clerk queries the system with the service member SSN and the system returns all transactions for the service member. (Freeman, Mabbutt, & MacDonald, 2010)

Table 3. Use Case 3. View Transaction characteristic information

Characteristic	**Information**
Brief Description	An account client transaction is viewed
Primary Actor	Supply clerk
Stakeholders	System administrators
	Authorized users
	Client
Trigger	Supply clerk enters client SSN and presses submit button
Preconditions	Client SSN must have recorded transactions in the database
Guarantees	*Success End Condition*
	Supply clerk is able to view queried client transactions
	Failed End Condition
	The query will not provide any client transactions
Main Success Scenario	1. Supply clerk logs into the website and navigates to the View Transaction page
	2. Clerk enters client's SSN and presses submit button
	3. The system returns the client's transactions

User Interface Design

The UML Activity diagram (Figure 2) references Use Case 2 Add Transaction. To describe this workflow it is assumed that Use case 1 Create Account has already successfully occurred. Moth, D. UML Resources.

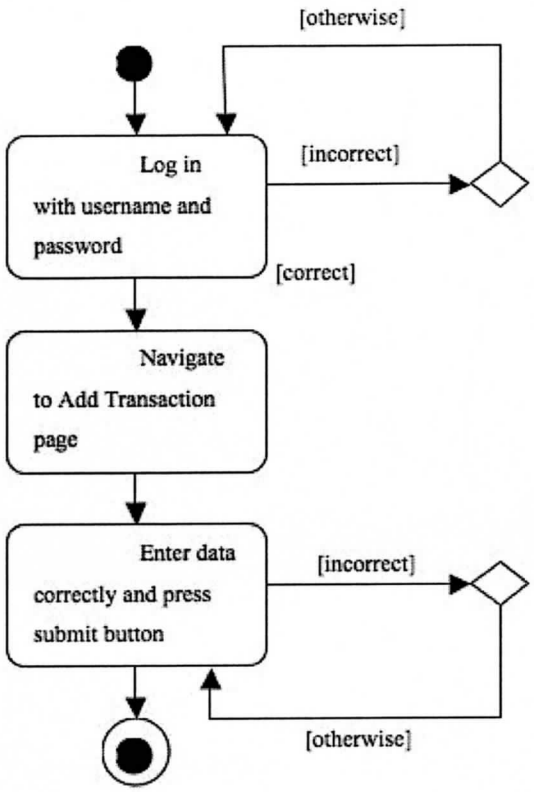


Figure 2. User interface diagram

Initial Business requirements

This section includes a description of the security requirements, performance requirements, availability requirements, and system requirements.

Security requirements.

- The user must be able to log into the system with a username and password that is issued by the system administrator.
- The administrator will conduct standard audits on the system as they are scheduled.
- The user will comply with data validation requirements for data entry before data can be submitted to the system.

- The administrator must meet information assurance requirements on network components and software before the system is accredited to operate or pass audits or network scans.

Performance requirements.

- The administrators must provide a response to any service calls within 24 hours.
- The user must be able to conduct a query or conduct a transaction on any system interface in no more than 5 seconds.
- The user must be ensured that throughput is great enough to conduct transactions against the system within 5 seconds.

Availability requirements.

- User must have access to any system data 95% of the time.
- User will have access to the Helpdesk between 0730 and 1530.
- The system will not be accessible no more than five hours per week for scheduled downtime (Wiegers, 1999).

System requirements. System requirements include network needs, backup and recovery needs, and storage capacity needs.

Network needs. Network needs include access, audit, data integrity, and networking requirements.

Access requirements

- The system will require industry standard authentication
- The system must enforce that Username/password strength is DoD compliant
- The system must enforce Lockout policy that is DoD compliant

Audit requirements

- The administrator shall implement an audit strategy compliant with DoD standards
- The administrator shall develop an audit schedule to conform to regulations
- The administrator shall conduct audit reporting method and reporting procedure

Data integrity requirements

- The system will require all data fields require data entry
- The system will require data field entry must comply with required data format
- The system will require Data field entry must comply with specified pattern

- The system will require data field entry must comply with data range setting
- The system will require Validation summary must define integrity requirements

Networking requirements

- The system will require routing restrictions
- The system will require that physical ports will be shutdown if not utilized
- The system will enforce Firewall rules that limit traffic
- The system will provide for traffic monitoring
- The system will enforce restriction with access control lists

Backup and Recovery needs. Backup and recovery needs include backup requirements, disaster recovery requirements, physical security requirements, and redundancy requirements/

Backups

- The system shall conduct full database daily backups
- The system shall conduct backup database transaction logs weekly
- The administrator shall ensure that backups are available at the backup site

Disaster recovery

- The administrator shall perform a risk assessment to establish risk response posture
- The administrator will ensure alternative services within 6 hours upon the event of disaster
- The administrator shall ensure functionality of a continuity of operations backup site

Physical security (ensures availability)

- The administrator will guarantee that CCTV recording will be utilized onsite 24/7
- The administrator will ensure the facility will be staffed with armed security guards
- The administrator will ensure proper identification is presented before facility access
- The administrator will conduct security awareness training

Redundancy

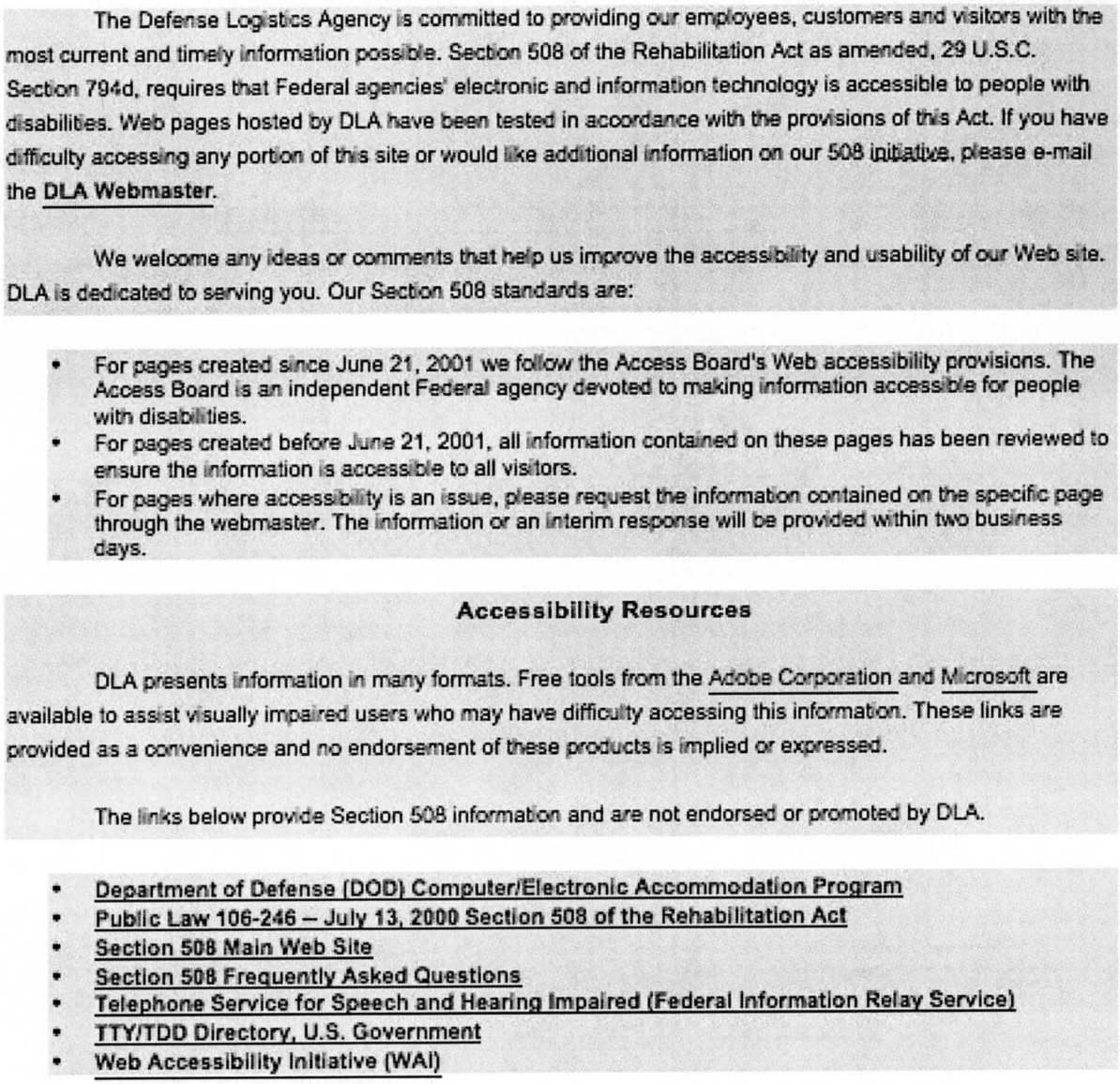
- The administrator shall ensure virtual machine redundancy with additional service consoles
- The administrator shall ensure VMware network redundancy by adding a second vmnic to the service console switch configured with NIC teaming
- The administrator will ensure HVAC and fire suppression with the two of everything approach
- The administrator will ensure data center redundancy with UPS service

Storage Capacity needs.

- First year- 40 Gigabyte NAS servers x15
- Second year- 40 Gigabyte NAS servers x30
- Fifth year- 40 Gigabyte NAS servers x40 (Borysowich, 2009)

Section 508 Compliance

Figure 3 is a copy of the Section 508 Compliance Statement and Accessibility Checklist.



The Defense Logistics Agency is committed to providing our employees, customers and visitors with the most current and timely information possible. Section 508 of the Rehabilitation Act as amended, 29 U.S.C. Section 794d, requires that Federal agencies' electronic and information technology is accessible to people with disabilities. Web pages hosted by DLA have been tested in accordance with the provisions of this Act. If you have difficulty accessing any portion of this site or would like additional information on our 508 initiative, please e-mail the **DLA Webmaster**.

We welcome any ideas or comments that help us improve the accessibility and usability of our Web site. DLA is dedicated to serving you. Our Section 508 standards are:

- For pages created since June 21, 2001 we follow the Access Board's Web accessibility provisions. The Access Board is an independent Federal agency devoted to making information accessible for people with disabilities.
- For pages created before June 21, 2001, all information contained on these pages has been reviewed to ensure the information is accessible to all visitors.
- For pages where accessibility is an issue, please request the information contained on the specific page through the webmaster. The information or an interim response will be provided within two business days.

Accessibility Resources

DLA presents information in many formats. Free tools from the Adobe Corporation and Microsoft are available to assist visually impaired users who may have difficulty accessing this information. These links are provided as a convenience and no endorsement of these products is implied or expressed.

The links below provide Section 508 information and are not endorsed or promoted by DLA.

- **Department of Defense (DOD) Computer/Electronic Accommodation Program**
- **Public Law 106-246 – July 13, 2000 Section 508 of the Rehabilitation Act**
- **Section 508 Main Web Site**
- **Section 508 Frequently Asked Questions**
- **Telephone Service for Speech and Hearing Impaired (Federal Information Relay Service)**
- **TTY/TDD Directory, U.S. Government**
- **Web Accessibility Initiative (WAI)**

Figure 3. Section 508 Compliance Statement and Accessibility Checklist

System Design Document

This section describes the system design document.

Purpose of the System Design Document. The System Design Document represents the system design through tables, use cases and UML diagrams within the parameters of the stated assumptions and constraints. Requirements gathered in the Business requirements document have been referenced for construction of the various System design diagrams. The System Design Document clarifies how the customer's business requirements have been met.

System Architecture. The System Architecture Design Document demonstrates the components of the Issue system cloud infrastructure. Issue.mdf, document storage and the Issue web application are virtual applications stored on Network attached storage. The ESXI server provides hypervisor services to manage the virtual applications. The Virtual Center Server manages the virtual environment. The VMware distributed switch provides network monitoring and firewall services. End user devices such as mobile personal computers are connected to the physical network. (VMware, Inc. n.d.)

VMware vCenter Server Performance and Best Practices. The System Software Architecture Document diagrams the core software components and their dependencies.

Reserved.aspx is the login page and requires authentication for accessibility.

CreateAccount.aspx allows for service member account creation. Access and account creation is contingent upon successful authentication with Reserved.aspx.

AddTransaction and ViewTransaction web pages are also contingent upon successful authentication with Reserved.aspx and require an account to be created with CreateAccount.aspx to be able to add and then view transactions. (Cogswell, Cox, Lowe, 1998)

IssueClient.mdf stores customer account and transaction tables and data. Access to the database data is contingent upon an account being created with CreateAccount.aspx or transactions being added or viewed from the AddTransaction or ViewTransaction pages. (Freeman, Mabbutt, & MacDonald, 2010)

Allowances page allows the Supply clerk to view allowances that have been allotted to the service member for maintenance of their uniforms from DFAS. Accessibility is contingent upon successful authentication with Reserved.aspx. (Cogswell, Cox, Lowe, 1998)

Documentstorage is for file services and provides a repository for forms such as the DA 5965 that are receipts for transactions recorded in Issue.mdf. Accessibility is also contingent upon successful authentication with Reserved.aspx. . (Cogswell, Cox, Lowe, 1998)

Assumptions / Constraints

Table 4. Assumptions

No.	Assumption	Status	Comments
1.	DoD will provide project funding through Relase 1.0	Confirmed	DLA has source funding through Release 1.0
2.	Critical personnel will not be matrixed, if so capability set will be replaced	Confirmed	Agreed upon requirements
3.	Projected DOD budget constraints will not prevent future releases	Open	Preliminary budget supports project funding through FY14

Table 5. Constraints

No.	Constraint	Area	Comments
1.	The pilot program will be delivered within the timeline	Project management	PM agreement
2.	The pilot program will be within budget	Resource availability	Funding caps are set
3.	Program versions contingent upon DoD and DLA budgets	Funding	Follow on releases are not funded beyond FY14

System Architecture Design Document

The System Architecture Design Document represents the system and hardware architecture design of the Issue system. (Mosaic Technology, 2010)

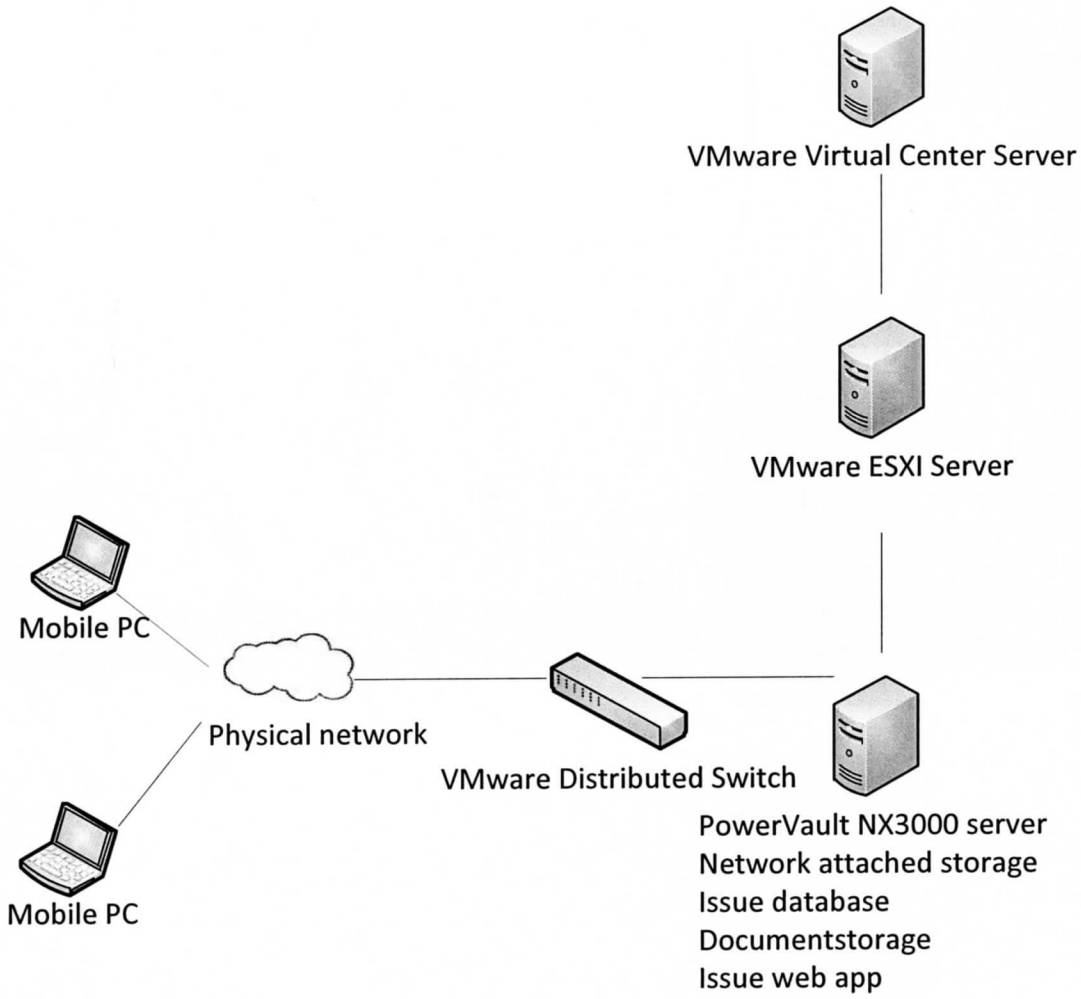


Figure 4. Architecture design document

System Hardware Components

The System Hardware Architecture table (Table 6) defines the basic functions of the components that make up the cloud architecture represented in the System Architecture Design Document.

Table 6. Main components (VMware, Inc., 2012)

Component	Manufacturer	Function/capability
VMware ESXI Server	VMware	Hypervisor architecture Controls and manages resources
VMware Virtual Center Server	VMware	Server software that manages virtual environment
VMware Distributed Switch	VMware	Networking the virtual machines Monitoring/firewall services
Power Vault NX3000 Server	Dell	Network Attached Storage Virtual machines-Web server, Relational database, file server

Database Entity Relationship Diagram

The Database entity relationship diagram (Figure 5) demonstrates the relationships between the entities in the Issue.mdf database. The Issue.mdf database records the customer transactions that are entered by the DLA clerk or the Supply clerk.

Primary key ID in the customer table is a foreign key in the transactions tables and enables transactions to be added and viewed by the DLA or Supply clerk. ID is also a foreign key in the allowances table allowing the Supply clerk to view Defense Finance and Accounting Services pay allowances allotted to the service member to be viewed.

The Data Dictionary diagram (Figure 5) documents the column description, data types, column names, etc of the three tables of the Issue.mdf database. (Fehily, 2002)

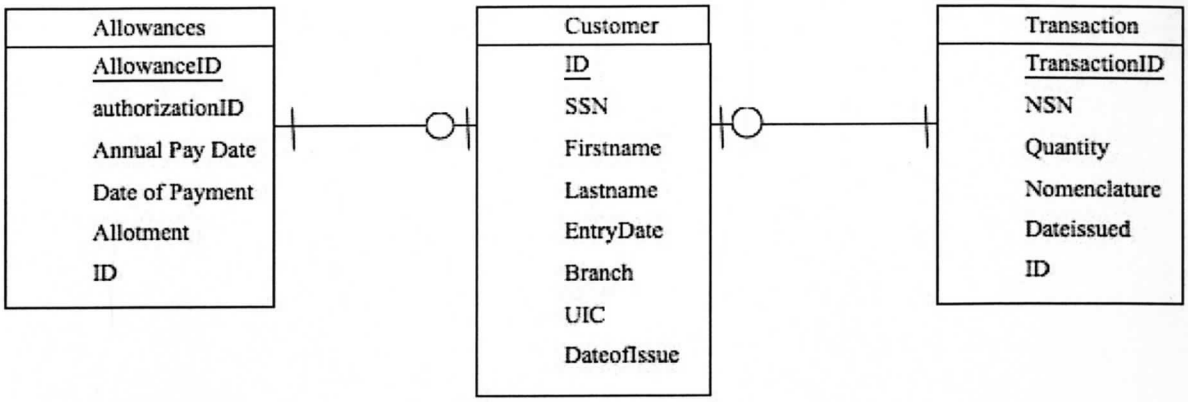


Figure 5. Entity relationship diagram

Table 7. Issue.MDF Data Dictionary

Allowances table				
Column Name	**Data Type**	**Allow Nulls**	**Column description**	**PK/FK**
AuthorizationID	int	Yes	Authorization ID#	
AllowanceID	int	No	Allowance ID#	Pk
[Annual pay date]	date	Yes	Date of DFAS annual allowance	
[Date of payment]	date	Yes	Date of DFAS annual payment	
Allotment	varchar(50)	Yes	annual allowance dollar amount	
ID	int	Yes	Customer ID	Fk
Customer table				
Column Name	**Data Type**	**Allow Nulls**	**Column description**	**PK/FK**
SSN	varchar(50)	No	Service member SSN	
Firstname	varchar(50)	No	Service member Firstname	
Lastname	varchar(50)	No	Service member Lastname	
Entrydate	date	No	Service member Date of entry	
Branch	varchar(50)	No	Service branch	
UIC	varchar(50)	No	Unit identification date	
Dateofissue	date	No	Date of Initial issue	
ID	int	No	Customer ID	Pk
Transaction table				
Column Name	**Data Type**	**Allow Nulls**	**Column description**	**PK/FK**
Transaction#	int	No	Transaction ID#	Pk
NSN	nvarchar(50)	Yes	National stock #	
Quantity	int	Yes	Quantity issued	
Nomenclature	varchar(50)	Yes	Name of item	
Dateissued	date	Yes	Date of item issued	
ID	int	Yes	Customer ID	Fk

System Logical View

The System Logical View diagram (Figure 6) provides a logical perspective of the system. The diagram demonstrates the relationships between the classes as well as the methods and attributes of the classes (Moth, n.d.).

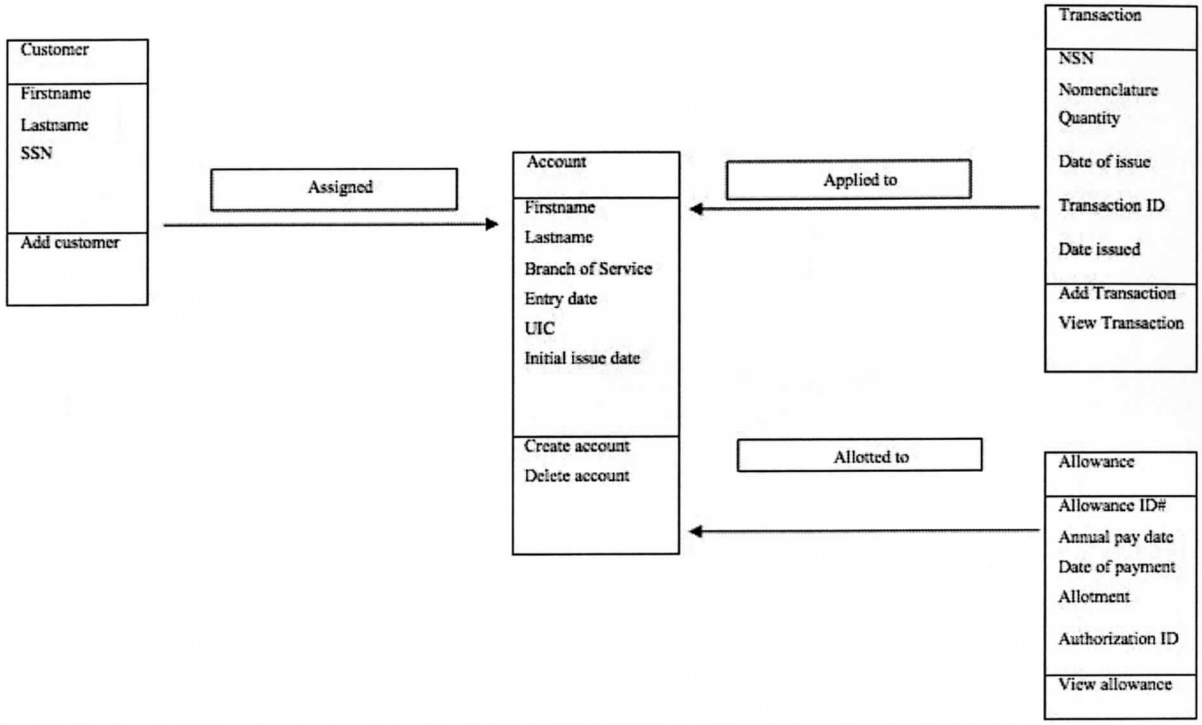


Figure 6. UML class diagram

System Communication Architecture

The UML Communication diagram (Figure 7) reflects the behavior of the classes that are depicted in the System Logical View diagram. The objects of the communication diagram depict instances of these classes and the communication diagram shows the relationships between them. The Communication diagram represents use cases documented in the business requirements document.

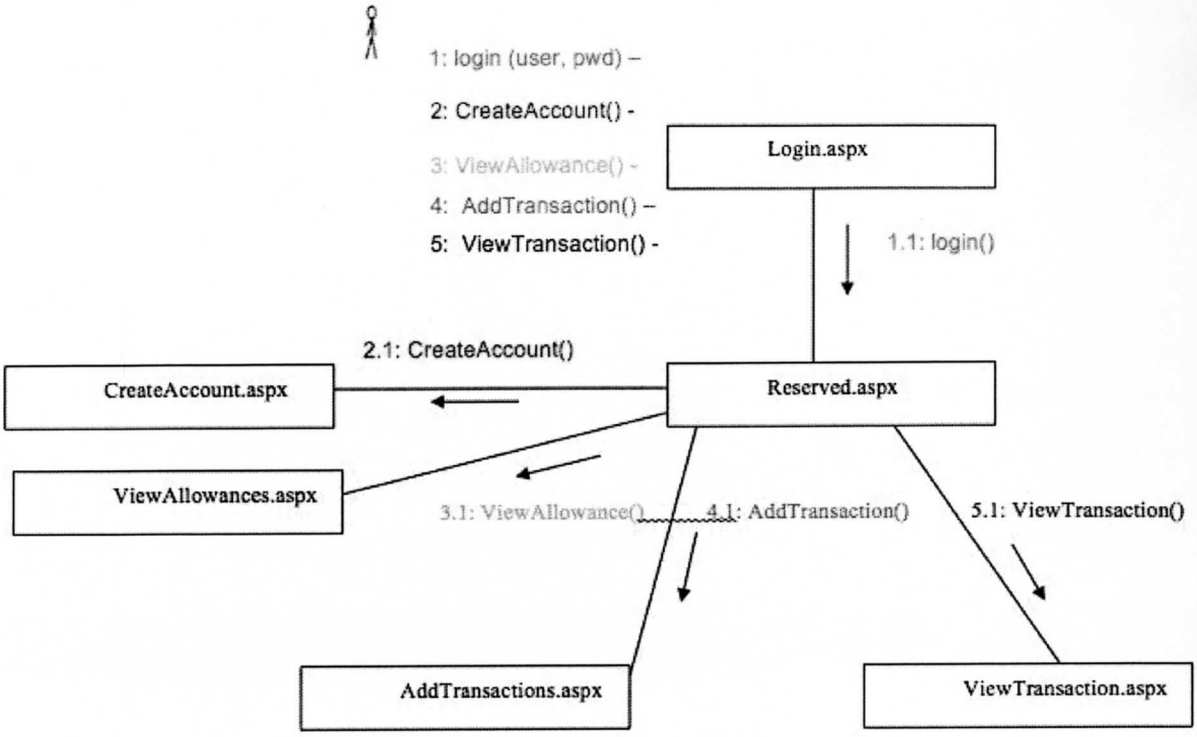


Figure 7. UML communication diagram

System Software Architecture Document

The UML Component diagram (Figure 8) identifies the system software components and their relationships.

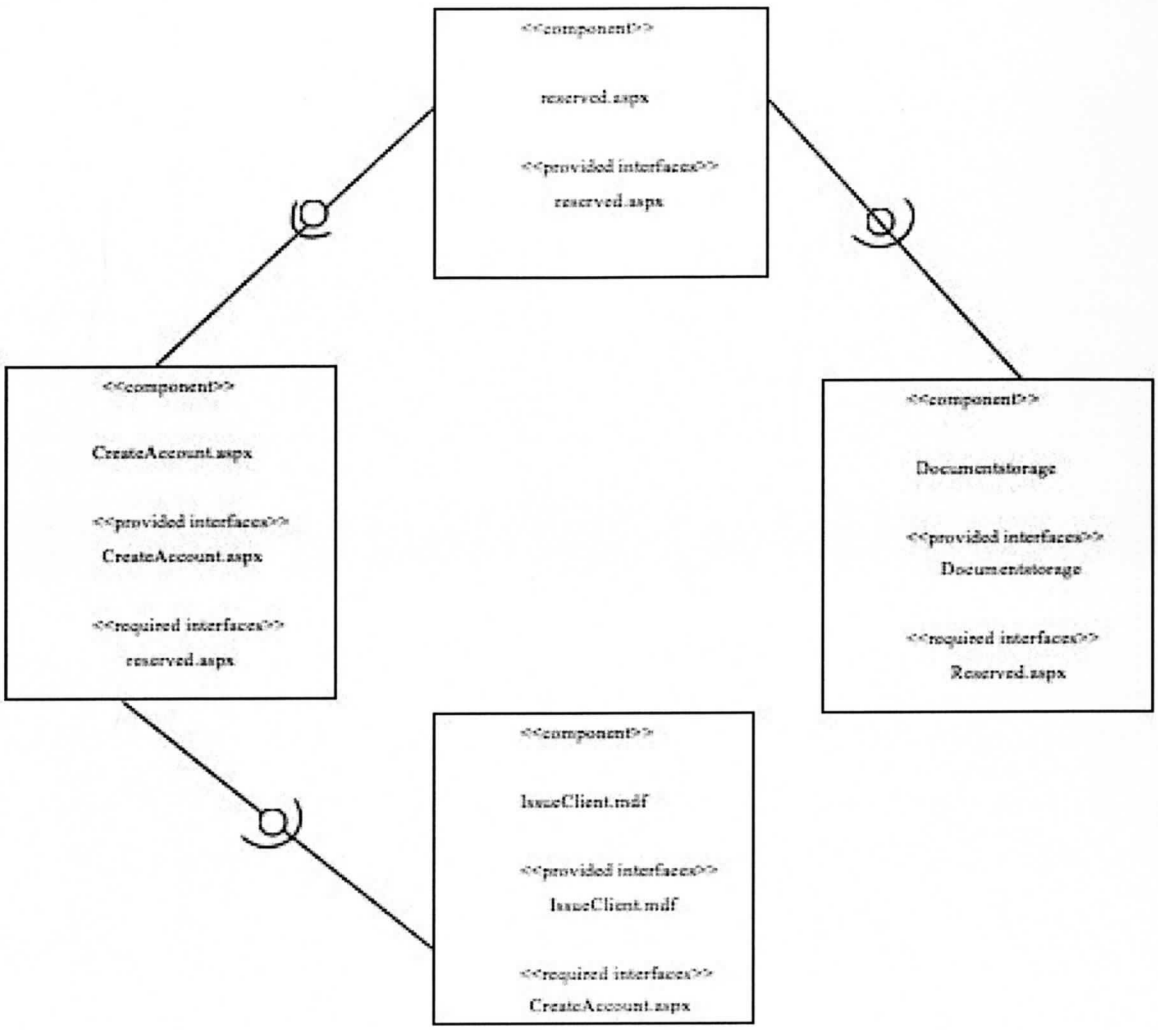


Figure 8. UML component diagram

System Security Architecture

The Security Use Case diagram (Figure 9) includes 2 actors and 4 use cases. Actor Supply clerk initiates windows authentication with a furnished username and password. (Freeman, Mabbutt, & MacDonald, 2010)

If Supply clerk fails to provide an assigned username or password three times they are locked out of the system. Actor System administrator is able to log activity and monitor

the system for illegal or unauthorized activity. System administrator is able to control data entry with data validation controls. (Darie & Ruvalcaba, 2006)

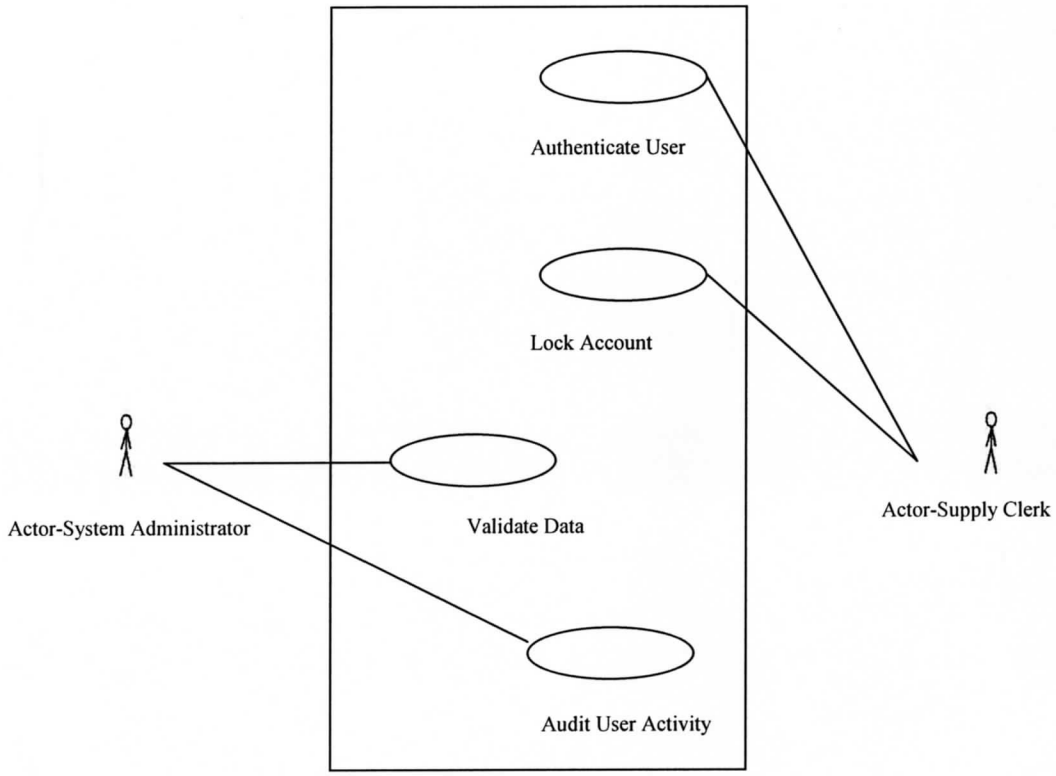


Figure 9. Security use case diagram

The following use cases correspond to the Security use case diagram. The use cases define the security mechanisms. (Firesmith, 2003)

Use Case 1. Authenticate user enforces windows authentication through the requirement of an authorized username and password. The username and password is issued by the system administrator to all authorized personnel. The user must provide their username and password to be granted access to the system (Cogswell, Cox, & Lowe, 1998).

Table 8. Use Case 1. Authenticate User characteristic information

Characteristic	**Information**
Brief Description	Windows authentication enables login with a username and password
Primary Actor	Authorized users
Stakeholders	System Administrators
	Authorized users
	Clients
Trigger	Having entered a username and password the authorized user hits the login button
Preconditions	User is authorized with a valid username and password
Guarantees	*Success End Condition*
	User is allowed entry to the system
	Failed End Condition
	User is denied access to system
Main Success Scenario	1. The user navigates to the website
	2. The user enters a valid username and password
	3. The user hits the login button
	4. The user is given access to the system

Use Case 2. Lock account prevents unauthorized entry. If a user provides an unauthorized username or password three times they are locked out of the system and must contact the system administrator to have their account unlocked. Failed attempts are logged by the system

Table 9. Use Case 2 Lock Account characteristic information

Characteristic	**Information**
Brief Description	Lockout policy restricts access to three failed attempts
Primary Actor	User
Stakeholders	System administrators Authorized users
Trigger	User attempts to login in three times with an unauthorized username or password
Preconditions	Three attempts with a wrong username or password have been attempted
Guarantees	*Success End Condition* User account will be locked *Failed End Condition* User will gain unauthorized access to the system
Main Success Scenario	1. The user navigates to the website 2. The user enters a wrong username or password three times 3. The system message informs the user they have failed at three login attempts. The account has been locked and they need to contact the helpdesk for assistance

Use Case 3. Audit user activity logs user activity and monitors the system for unauthorized or illegal activity. The system logs account, software, and security activity. System login is recorded as well as software incidents and security flags. The system records unauthorized usage and reports the incident to the system administrator. The system directs the administrator to the logs for further details. The system provides additional tools which detail the unauthorized activity.

Table 10. Use Case 3 Audit User Activity characteristic information

Characteristic	**Information**
Brief Description	Audit policy to log activities and monitor usage
Primary Actor	System administrator
Stakeholders	System administrators Authorized users
Trigger	User logs into system
Preconditions	Having entered a username and password the authorized user hits the login button
Guarantees	*Success End Condition* System records user login/activity and successfully monitors unauthorized activity *Failed End Condition* System fails to record login/activity or unauthorized activity
Main Success Scenario	1. The user logs into the system 2. The system records user login/activity 3. The system reports any suspicious or illegal activity to the System Administrator

Use Case 4. Validate data provides data validation within the asp.net source code. Data controls include the Requiredfieldvalidator to ensure that data is changed from its initial value. The system also employs the Regularexpressionvalidator that enforces formatting and length rules for data entry. The Rangevalidator also controls data entry to ensure proper dates are entered. (Darie & Ruvalcaba, 2006)

Table 11. Use Case 4 Validate Data characteristic information

Characteristic	**Information**
Brief Description	Data validators are applied for data entry control
Primary Actor	System administrator
Stakeholders	System administrators Authorized users Client
Trigger	User enters data into the system in the unspecified format
Preconditions	A validator defines how the data can be entered into the system
Guarantees	*Success End Condition* Data is entered in incorrectly and message asks the user to review the errors *Failed End Condition* User is able to enter data in an unintended format
Main Success Scenario	1. The user logs into the system 2. The user either mistakenly or intentionally enters data in an incorrect format 3. The system message indicates format errors

System Performance

VMware ESXI Server.

- 200,000 I/O operations per second
- Eight-way virtual symmetric multiprocessing
- Up to 256 virtual CPU's
- 1TB ram per host

VMware Virtual Center Server.

- Centralized management of hosts and virtual machines
- Virtual Center services include license service, storage management, query & health, etc

- Datacenter pools resources including hosts and vm's across physically distributed locations
- VCenter clusters provide High Availability, Fault Tolerance and Distributed scheduling

VMware Distributed Switch.

- (PVLAN) Private VLAN's restrict communication between VM's reducing excess subnets
- vMotion simplifies network monitoring and troubleshooting
- Bi-directional traffic shaping helps limit traffic to or from a VM or group of VM's
- Third party switch support supports components from the Hardware compatibility list

Power Vault NX 3000 Server.

- Single Instant Storage identifies duplicate files
- Distributed File System gives easy access to data stored across WAN/LAN's
- File Service Resource Manager Improves auditing/planning with better control/compliance
- Initial Configuration Tasks streamline password, network, domain and update settings

CHAPTER 4

RESULTS AND DISCUSSION

The Issue application is a pilot web application to record transactions of uniforms that are issued to US military members. The system provides a cost effective alternative to current practices or lack thereof for documenting and inventorying the uniforms that are issued at basic training and afterwards. In addition the system provides information for monetary uniform allowances for service members.

Constrained defense budgets are forcing DoD to provide cost effective information service solutions. Interoperability and centralized management for information systems are key considerations for proposed DoD automated information systems. Some agencies have already migrated non-critical systems to the cloud and VMware is a toolset that some of these agencies have utilized. To justify expenditures, information systems must comply with policy objectives including standardization, cost savings and interoperability.

The Issue app originally was an alternative information system proposal. The original proposal was a web based phone logistics application for US military logisticians. The application would have likely duplicated applications already available so the Issue app was chosen as the phone app could not be justified. The original consideration for the Issue app was a vague proposal for a web based system that would record uniform transactions but not much consideration was given to detail until the phone app proposal was deemed unfeasible and terminated. Data collections in regards to DoD policy and procedure were derived from DoD regulations and defense agency websites. Data input for programming the web app was drawn from textbooks and technical websites. System design documentation data was collected from various websites particularly sites dedicated to UML and network diagramming.

It is assumed that DoD will pursue current policy objectives of standardization, interoperability and cost savings. It is also assumed that DoD will allocate and prioritize

funding for new automated information system releases or versions to implement the Issue program. Some federal agencies have been moving information systems to cloud based services, DoD is also in the process of moving systems to the cloud, it is assumed that cloud based architecture will be prevalent in the future planning of DoD information systems. The research method that was utilized was limited due to inaccessibility of some restricted government websites.

DoD agencies including the Army, Navy and Air Force each have extensive regulations and policies governing everything from acquisition to personnel appearance. The agencies largely manage their own automated information systems. DoD is convinced there is benefit in having at least some of these systems cooperatively shared among the agencies. In recent years DoD has placed greater emphasis on interoperability or the ability to share data or as in some cases such as with the Issue app for all agencies to utilize the same application. In a period of constrained budgets DoD is faced with the problem of how to build cost effective information systems that are also are interoperable and standardized. Legacy practices including paper trails and files saved on stovepipe applications often lead to inaccurate transaction and accounting costing DoD millions in terms of lost and replaced equipment.

Each agency manages the distribution of articles of uniforms for their respective service members at a facility called a CIIP which is managed by the Defense Logistics Agency. The agency is left to account for and track the distribution of the uniforms. To address problems of accountability, accurate reporting, standardization, etc the Issue app will mandate that all services must use this centralized system to verify and track the issue of uniform articles. The first step was a proposal was for a secure, web based inventory system able to query transactions. The following step was the software development solution including the web application coded in ASP.NET, an SQL Server transaction database and file storage for a digital paper trail. The final step was documenting the system.

The challenges were significant. The ASP.NET code was created from scratch and the database had to be modeled with SQL Server. Meeting thesis requirements and following proper thesis methodologies were essential to the paper. A familiarity with government agency regulations and standard practices is necessary to present a feasible solution. Significant research time spent searching through textbooks and researching websites to

develop code has helped to meet the requirements. The coding in ASP and SQL has been implemented through trial and error. General knowledge of thesis work is a result of researching the work of others along with thesis requirements of various universities and also through the guidance of University staff. By reviewing various regulations and .gov websites a greater understanding of the relationships between defense and combat support agencies results in a solution where the necessary agencies demonstrate contributed.

The solution resulted in a pilot web based inventory system with a backend database for querying and document file storage which is compliant with applicable regulations. In order to provide benefit to DoD the pilot presented should be followed with an initial release and following versions where system flaws could be remedied. The process has left some learned lessons. Following the SDLC is the ideal approach to system development. The lesson was learned as the coding began without diagramming. The size and complexity of government regulations and interdependencies among government agencies is an important consideration when working on federal projects. The process has been a lesson in the thoroughness required to document a proposed system.

CHAPTER 5

CONCLUSIONS

This project has attempted to meet the objectives stated in the Introduction. The goals included the production of a scalable and secure web enabled inventory system for DoD military uniform transactions and associated documentation. The project started by identifying the problem and in turn identifying a general expectation of the solution. The project has culminated with the anticipated deliverable pilot system that fulfills the requirements established within the Business Requirements Document.

The research process included different elements. Research began with the review of relevant DoD policies and regulations. It continued with a greater familiarity of the process of how service members uniforms are issued. Agencies involved and their relationships were studied along with some of the applicable policies. Familiarity with the participants and procedures has led to a feasible design solution. Applicable federal laws were given consideration.

Next in the research process was a determination of the software tools that could be used for design. The desire was to use tools that were industry recognized and commonly utilized among government agencies. Visual Web Developer was chosen for its user friendly IDE and easy to use ASP.net. The toolkit was also chosen because it included the RDBMS SQL SERVER 2008. Many development problems are often due to lack of experience with software tools and a lack of sophisticated knowledge about web programming. In addition to coding challenges, a novice understanding of RDBMS tools may require a lot of experimentation in the design of database table relations.

Coding was roughly 70 to 80 percent complete before the research system documentation with UML began. This phase of the research process included determining which UML diagrams would be needed for system documentation and how to construction the diagrams. Continued research assisted in proper application of UML diagrams.

Understanding of the intended use of the various UML diagrams only comes after review of many web references and much text review.

The entirety of the research and implementation of the findings results in a more comprehensive understanding of the MSIS project process and intentions as well as graduate level thesis work in general. Going forward some considerations are worthwhile. Having an immature understanding of the organizations involved and their practices can hamper progress throughout the design phase, following the traditional SDLC could prevented this. Adequate research into the relationships among federal agencies must be thorough before design phase and can result in scope creep if the project be implemented the way it was. Immaturity in web design theory can result in unnecessary and unprofessional work. This could be avoided with greater education in web page theory. Further research would be recommended into current practices by involved federal agencies. A more thorough understanding of DoD acquisition policies of DLA, Army, Navy, etc could only help and could potentially make a difference with a more suitable solution that is more in line with current DoD acquisition practices.

Several design documents are available to choose from. Most of these documents are formats prepared by federal agencies. Careful consideration was taken to select a design document that would be a suitable template to present the data of the anticipated deliverable. The document chosen required limited editing and allowed the data to be presented in an orderly and coherent manner.

In retrospect, more time dedicated to DoD acquisition policy as well as agency procedures from the outset could have resulted in a website layout that could better provide for the needs of the DoD community. Little if any time was given to researching SDLC options; more research in this area at the beginning may have produced a more fruitful course of action.

The Issue project was contemplated to answer a need within the DoD uniform issuing process. A statement of problem, goals and objectives presented the need and a solution. Background of the problem and a literature review provided some perspective. The process followed with research into DoD policy, procedures and regulations and selection of a design document. Visual Web Developer was utilized to design a GUI with backend and file storage databases. The chosen design document was used as an outline to document the system with

UML diagrams, tables and text with a nearly complete software system. References, List of tables, List of figures, key terms and conclusion were documented afterwards.

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APPENDICES

APPENDIX A: USERS' MANUAL

Scope of Work, Plan of Action, Activities

Name of the Company: (Department of Defense)

Name of the project – ISSUE (project will be funded by the Department of Defense)

Location - (WorldWide)

Introduction: The Issue system can help the defense department move toward greater service integration by implementing a system where all the uniforms issued to service members are tracked through a single portal. In a period of constrained budgets and to support the defense departments move toward cloud integration Issue can save money and decrease replication across the services. Plans for the project gave consideration to the defense department's goals of interoperability and cloud service migration. Consideration was also given to legacy practices of paper filing and how those files can be misplaced as well as the logistical footprint to maintain those files. The new system places emphasis on the importance of training young service members on the care and maintenance of the gear that is issued to them.

Background: Issue is a central repository for service members initial uniform issue and follow on clothing allowances. This is a Defense Department joint service effort and will act as the primary tool for tracking the uniforms that are issued to the service member. The project will include 5 general tasks. The first task as mentioned in the WBS is to determine the project scope. This is a 2 week task followed by a requirements analysis which will also take 2 weeks. The following three tasks are the programming, implementation and finally the testing of the system.

Objectives: The objective of the project is to present a system that can track the initial issue of all the uniforms that are issued to members of the US Armed Forces during their

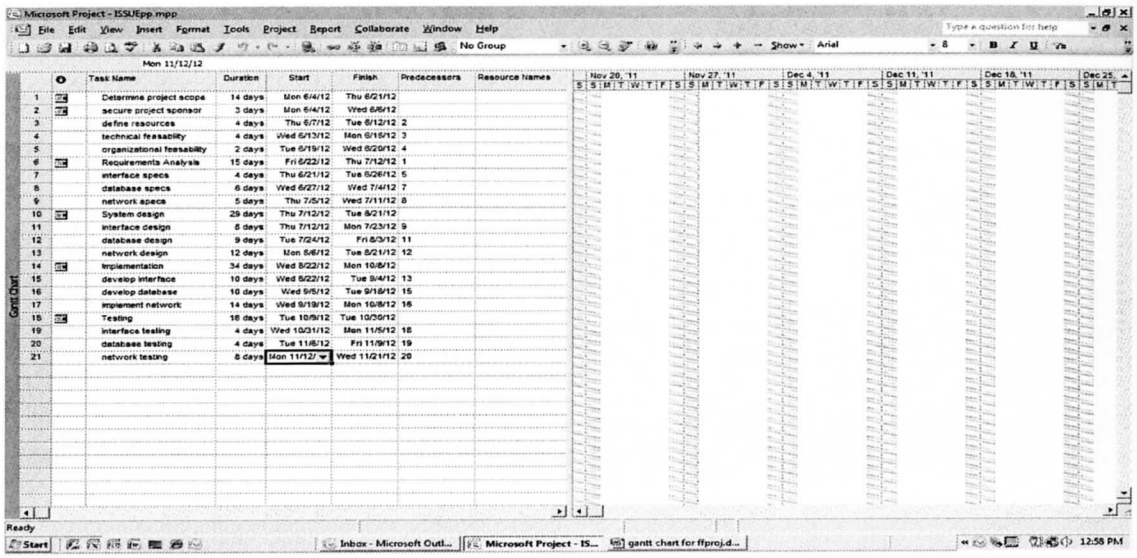
initial training and also track the history of the uniform allowances for each service member throughout their career.

Scope of Work: The project execution details are layed out in the WBS and Gantt chart. The project plan moves progressively from project scope and requirements analysis to system design, implementation and finally testing

Tasks: please see Work Breakdown Structure

Schedule: please see Gantt chart

APPENDIX B: WORK BREAKDOWN STRUCTURE



APPENDIX C: GANTT CHART